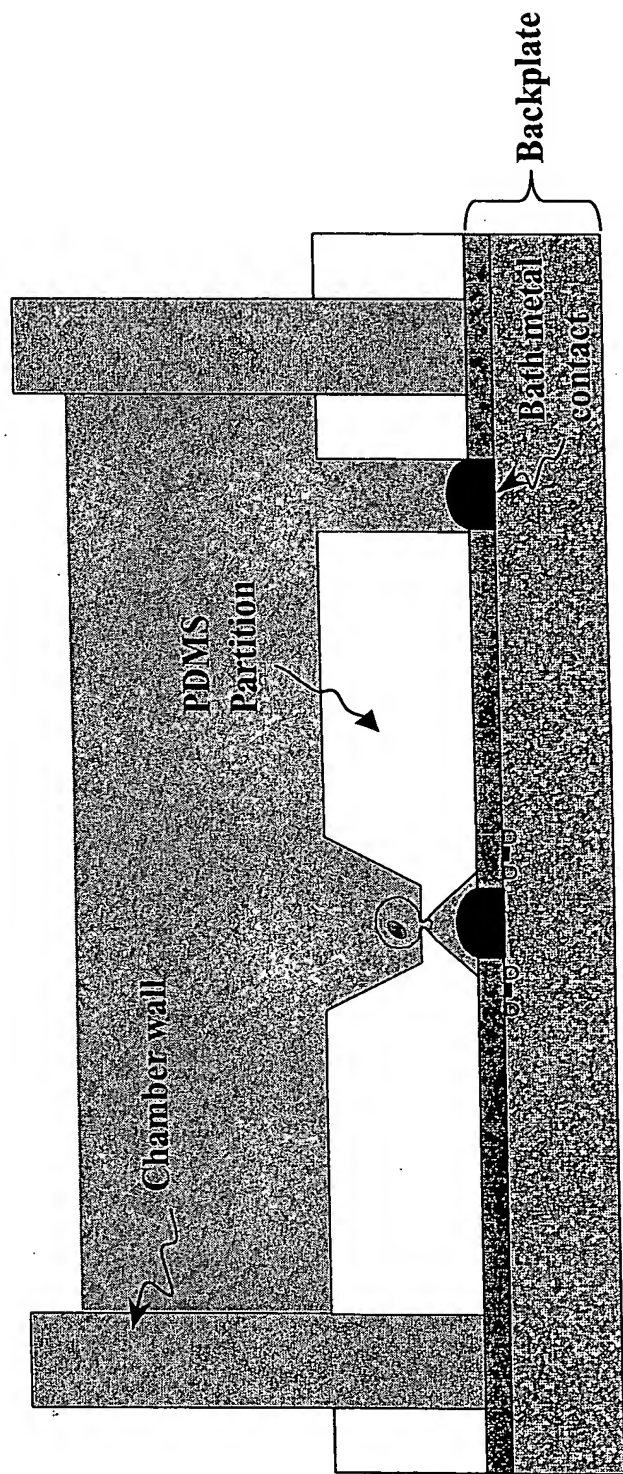
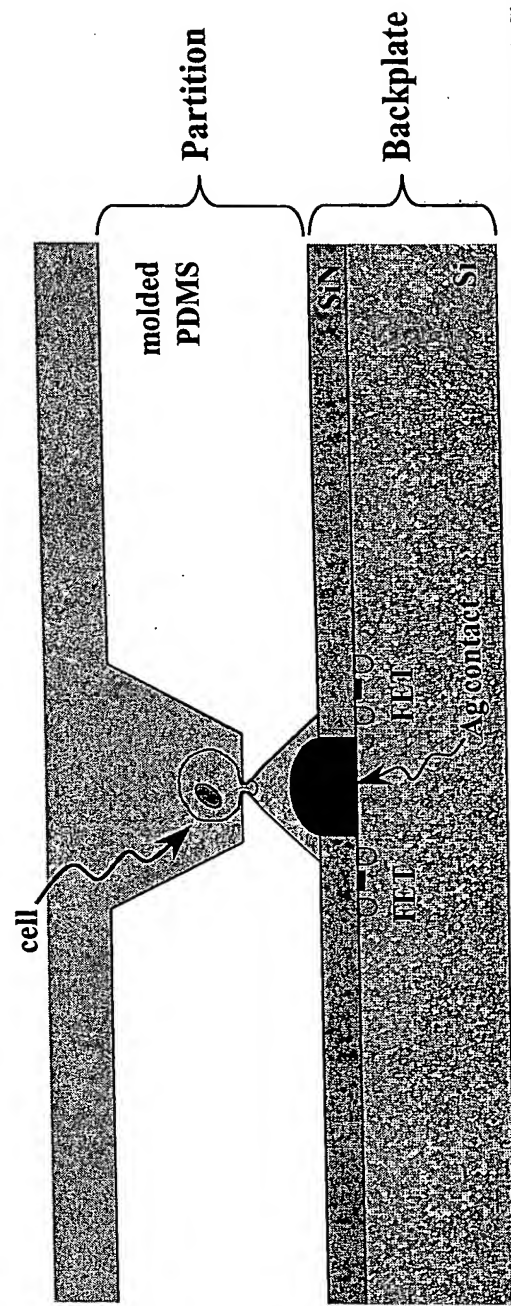


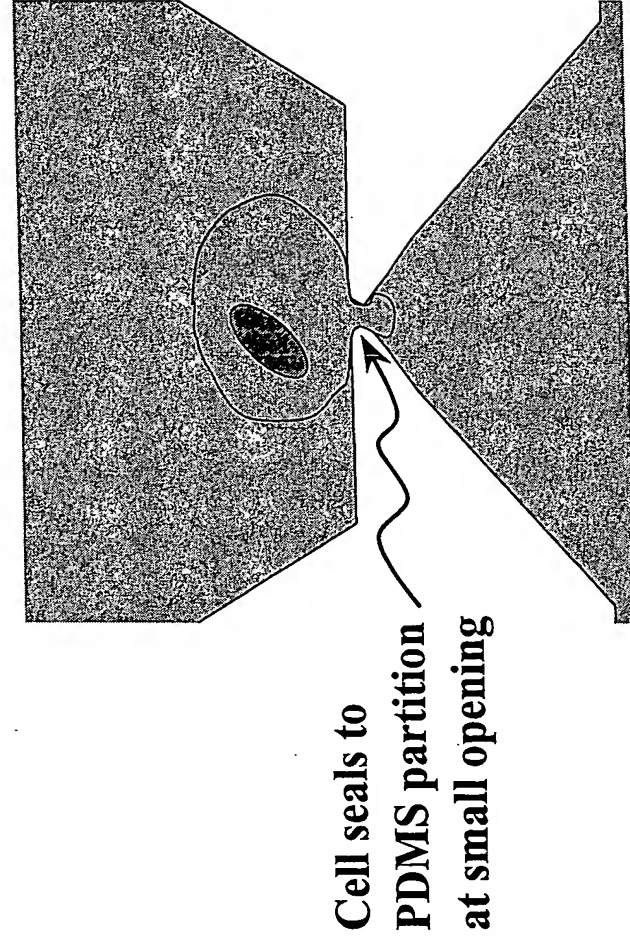
**Fig. 1a--PDMS patch electrode & associated components, side view**



**Fig. 1b--PDMS patch electrode, side view**



**Fig. 2--Close-up of cell contact point to partition**



**Fig. 3--Alternative PDMS patch electrode, side view**

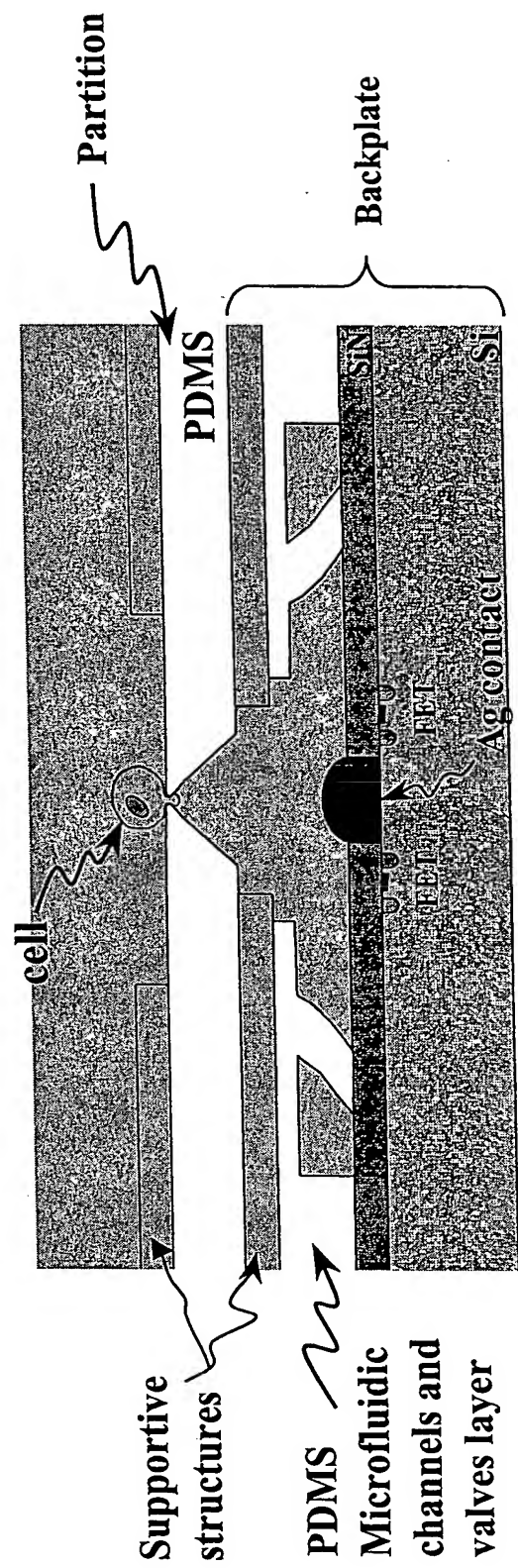
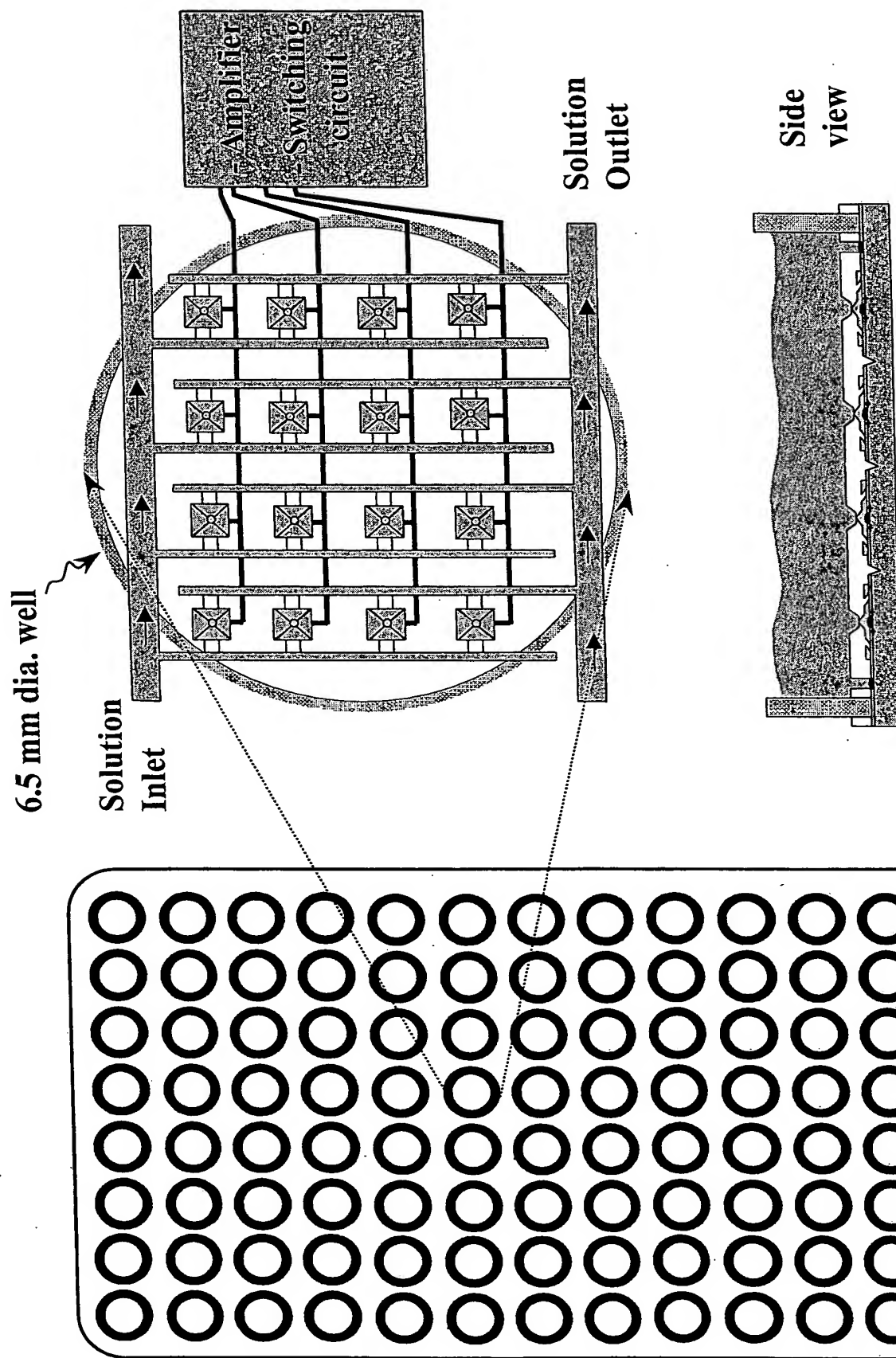
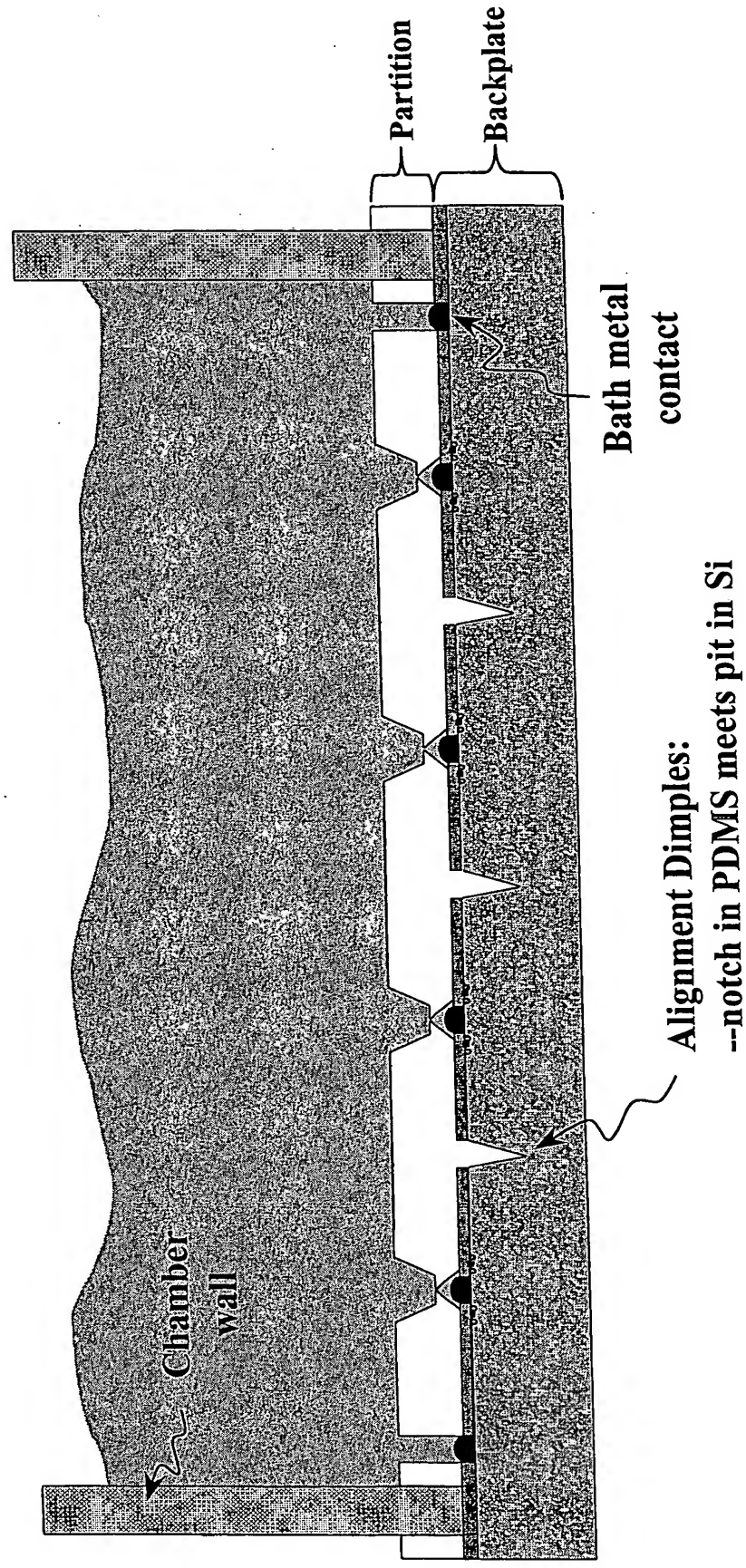


Fig. 4--Top view of a 96 well plate, 16 patch electrodes/well

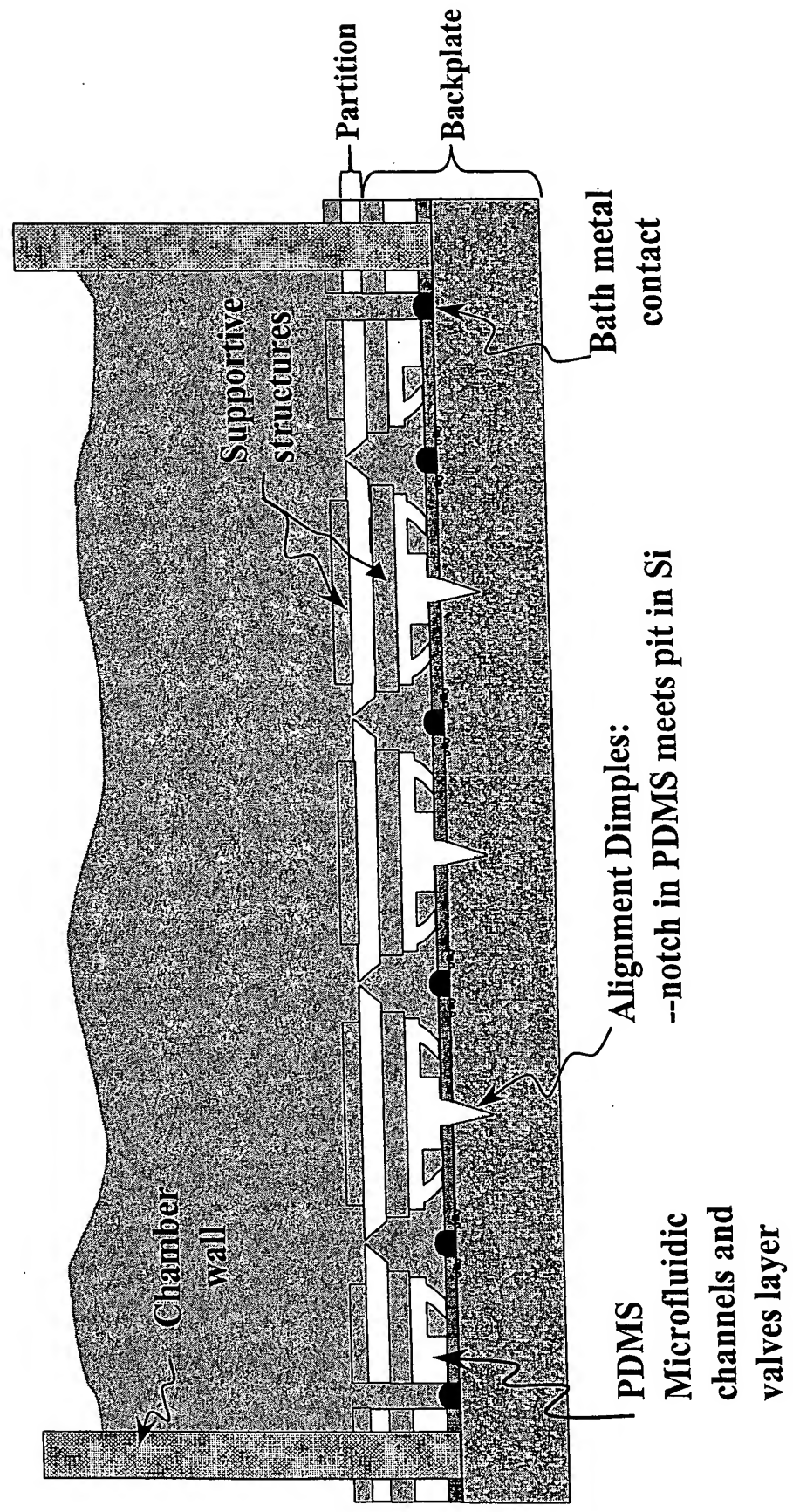


**Fig. 5--Side view of patch electrode array in a single well**

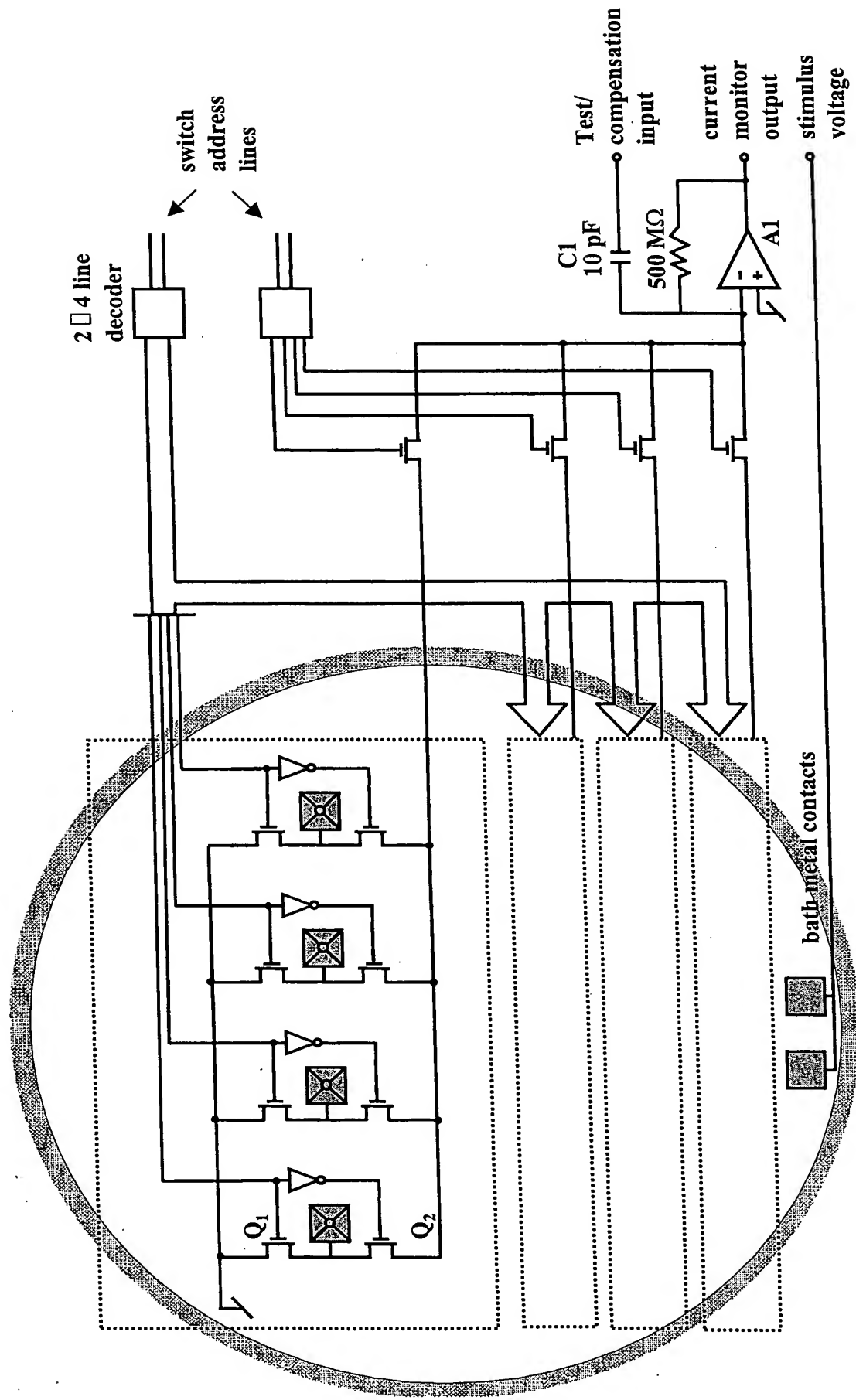




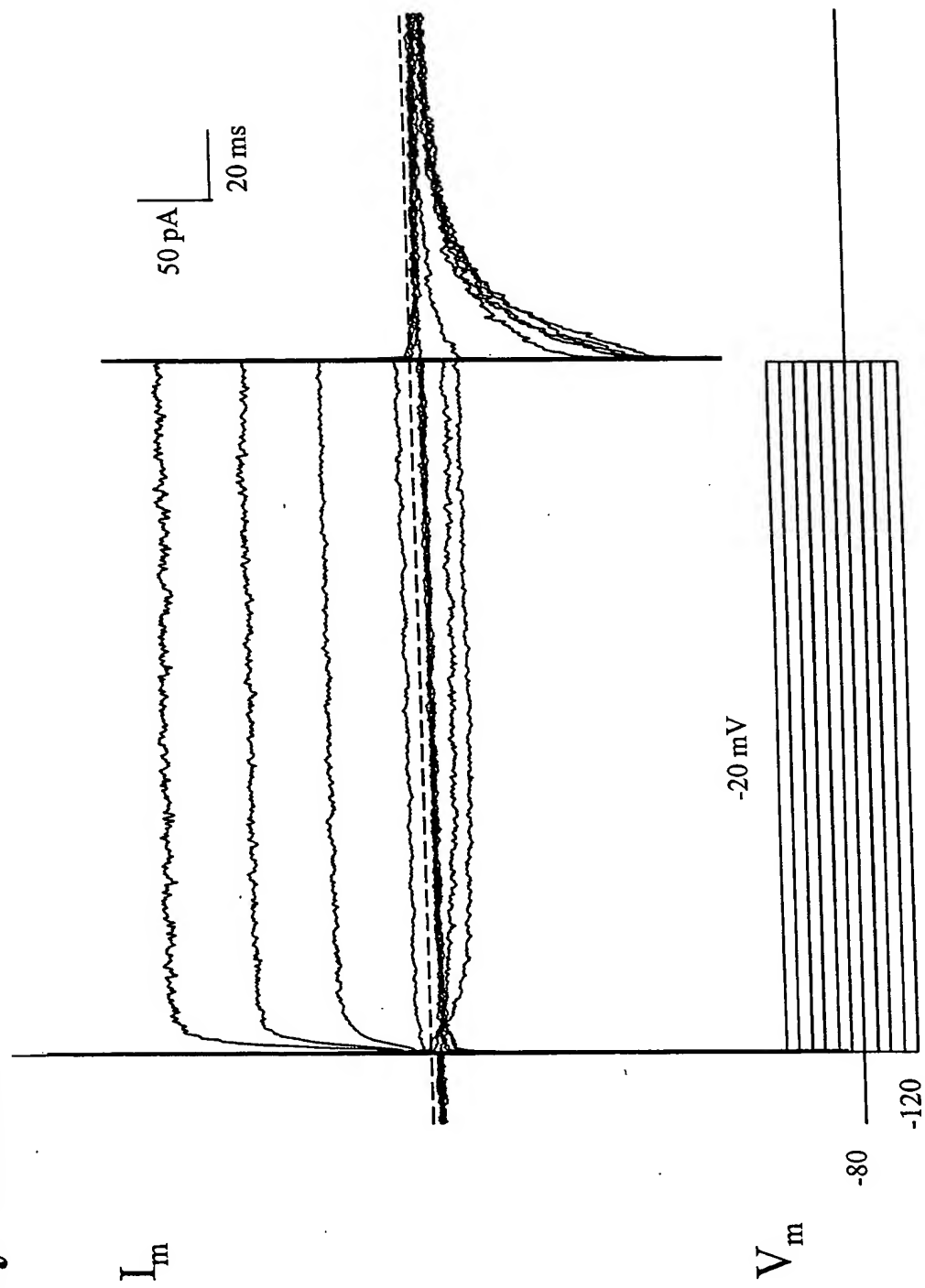
**Fig. 6--Alternative patch electrode array, including microfluidic solution exchange valves**



**Fig. 7--Electronic circuitry for a single well**

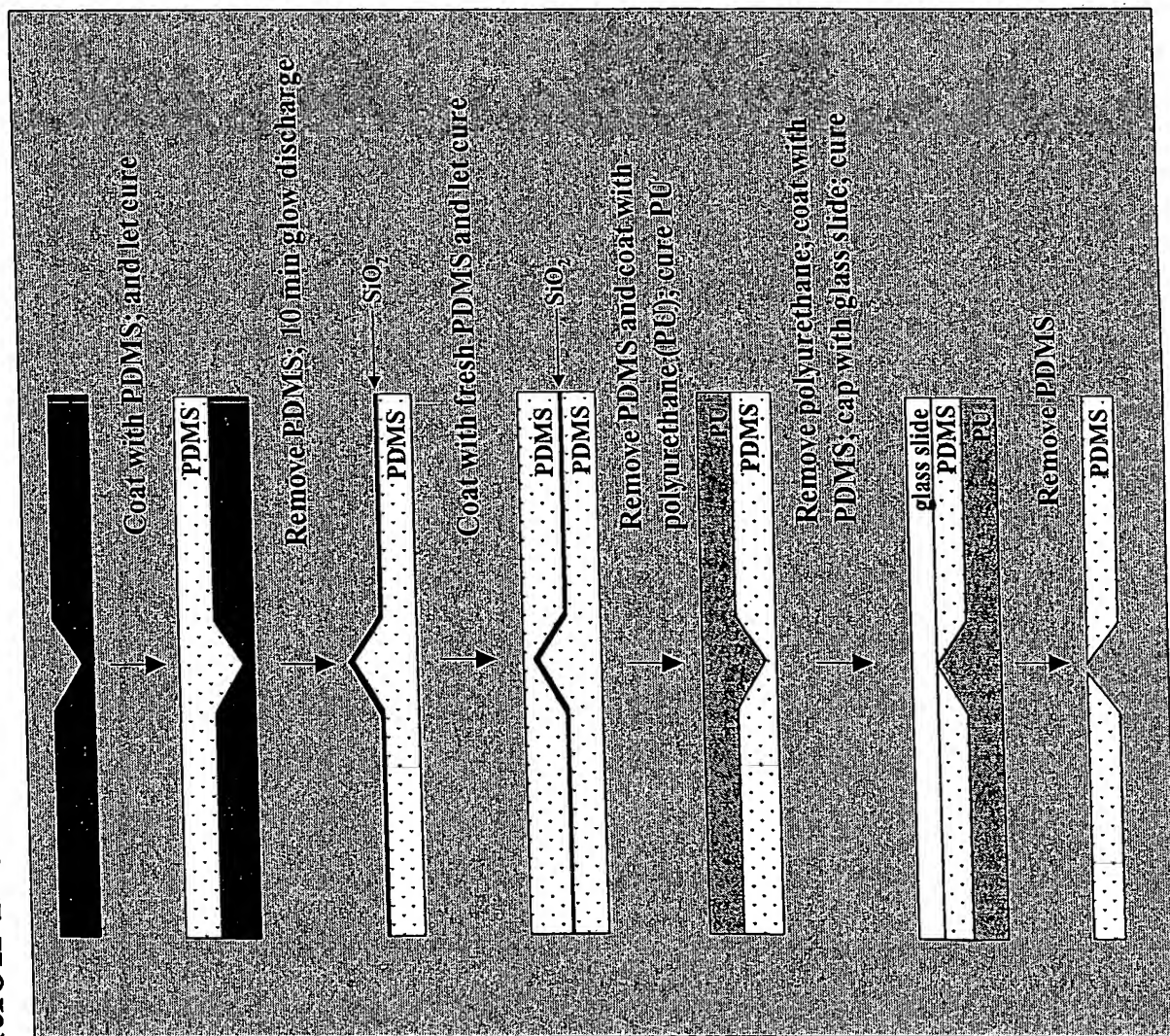


**Fig. 8--Shaker K<sup>+</sup> channel current recording from *Xenopus* oocyte sealed to planar PDMS patch electrode**

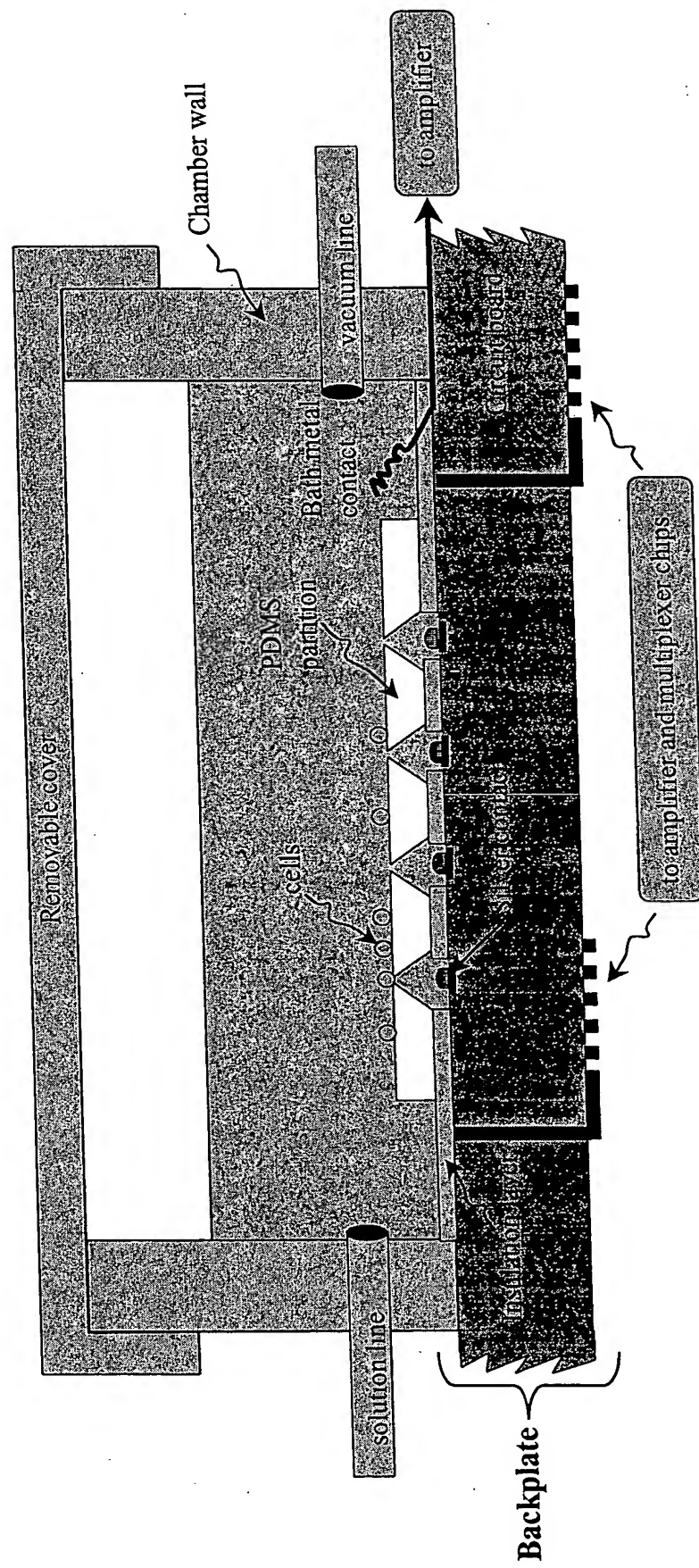




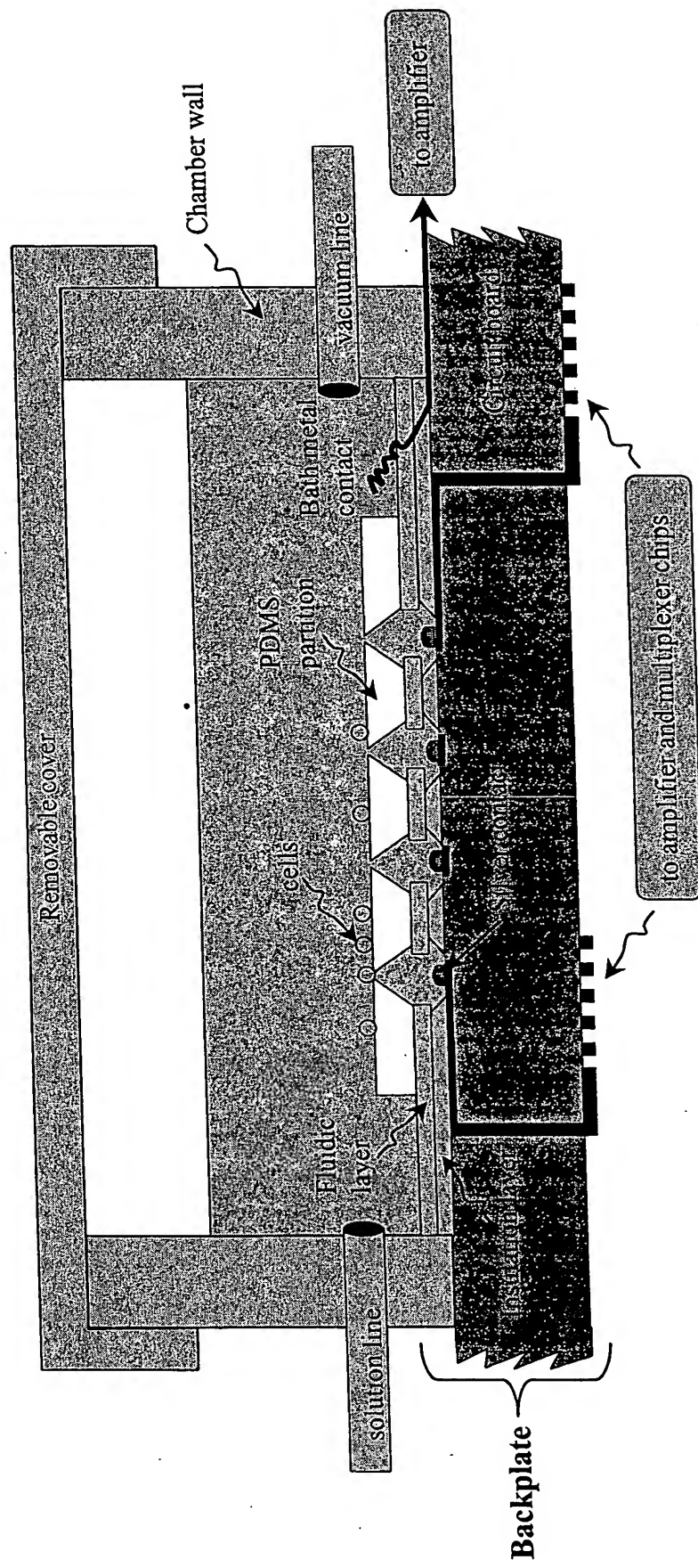
**Fig. 9—Process flow chart for micromolding PDMS electrode partition from a micromachined Si master**



**Fig. 10—PDMS patch electrode array system**



**Fig. 11—PDMS patch electrode array system,  
including fluidic layer**



The diagram illustrates the experimental system architecture, divided into three main functional areas:

- CELL PIPETTING SYSTEM:** This section includes a **PIPETTE** and **TISSUE CULTURE CELLS IN SUSPENSION**. It is connected to the **EXPERIMENTAL STAGE** via a line labeled "cells & bath solutions".
- COMPOUND PIPETTING SYSTEM:** This section includes a **PIPETTE**, **DRUGS**, a **MULTIWELL PLATE (96, 384 or 1536 format independent)**, and a **STACKER with up to 10 plates**. It is connected to the **EXPERIMENTAL STAGE** via a line labeled "drugs".
- EXPERIMENTAL STAGE:** This central area contains the **ELECTRODE PLATE** and **HEADSTAGES**. It receives inputs from the pipetting systems and is connected to the **Pressure CONTROLLER** and **Internal solution PUMPS**.
- Data Processing:** The **Pressure CONTROLLER** and **Internal solution PUMPS** are connected to **AMPLIFIERS**, which then feed into a **DIGITIZER**. The **DIGITIZER** is connected to a **COMPUTER**, which is also connected to a **MONITOR** and a **KEYBOARD**.

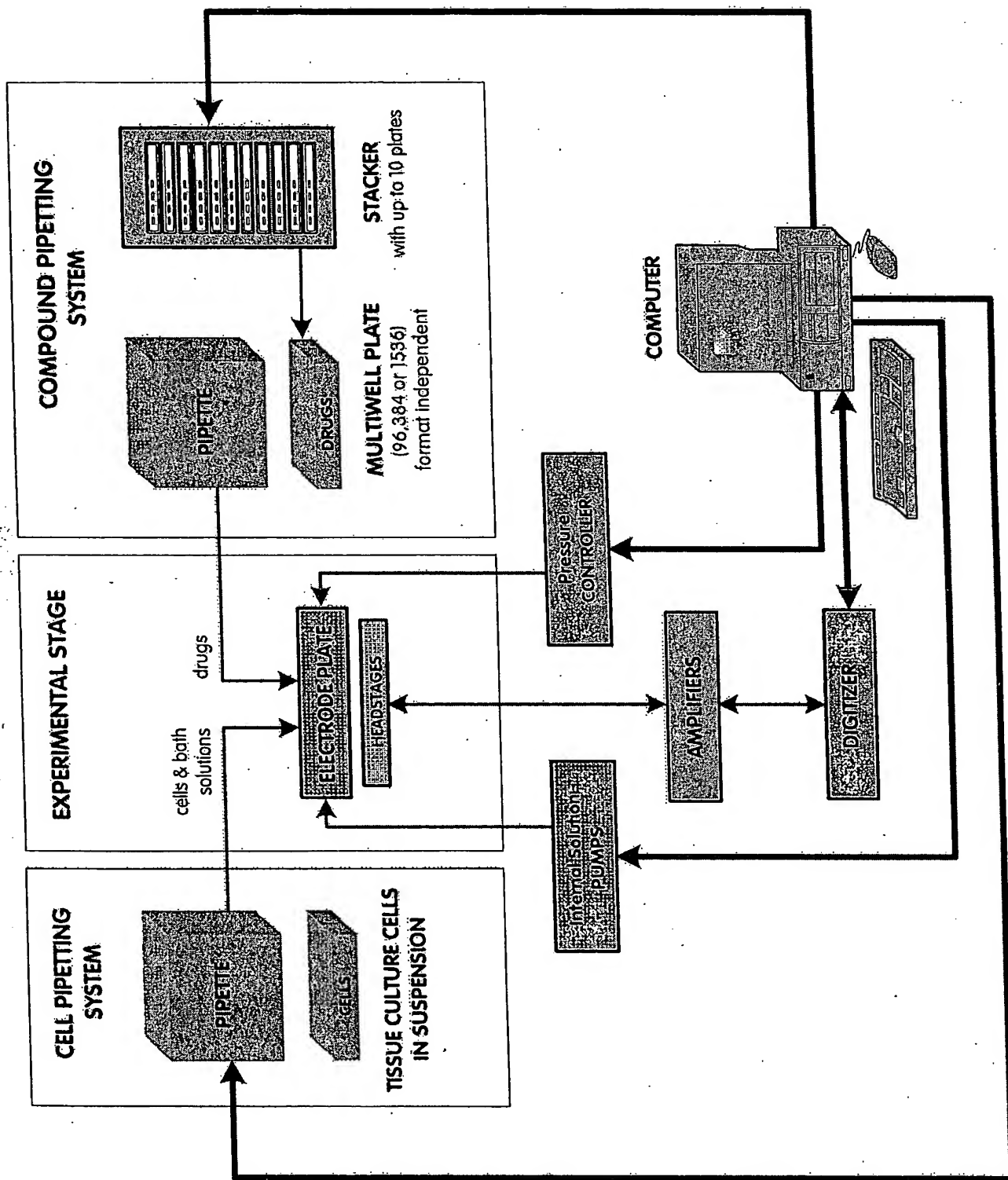
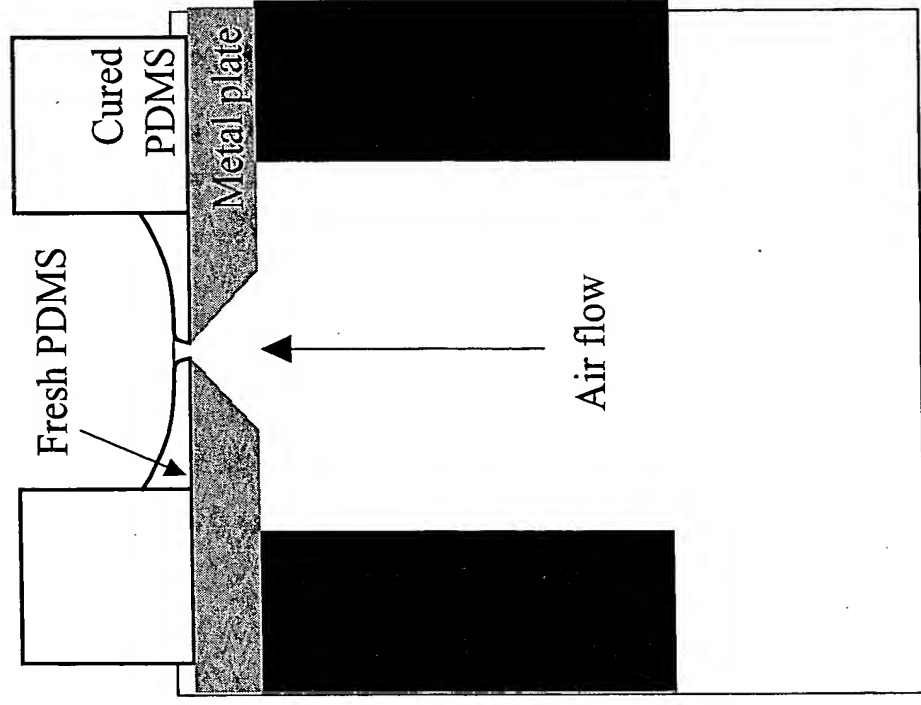


Figure 13



⊠ Not drawn to scale!

Figure 14

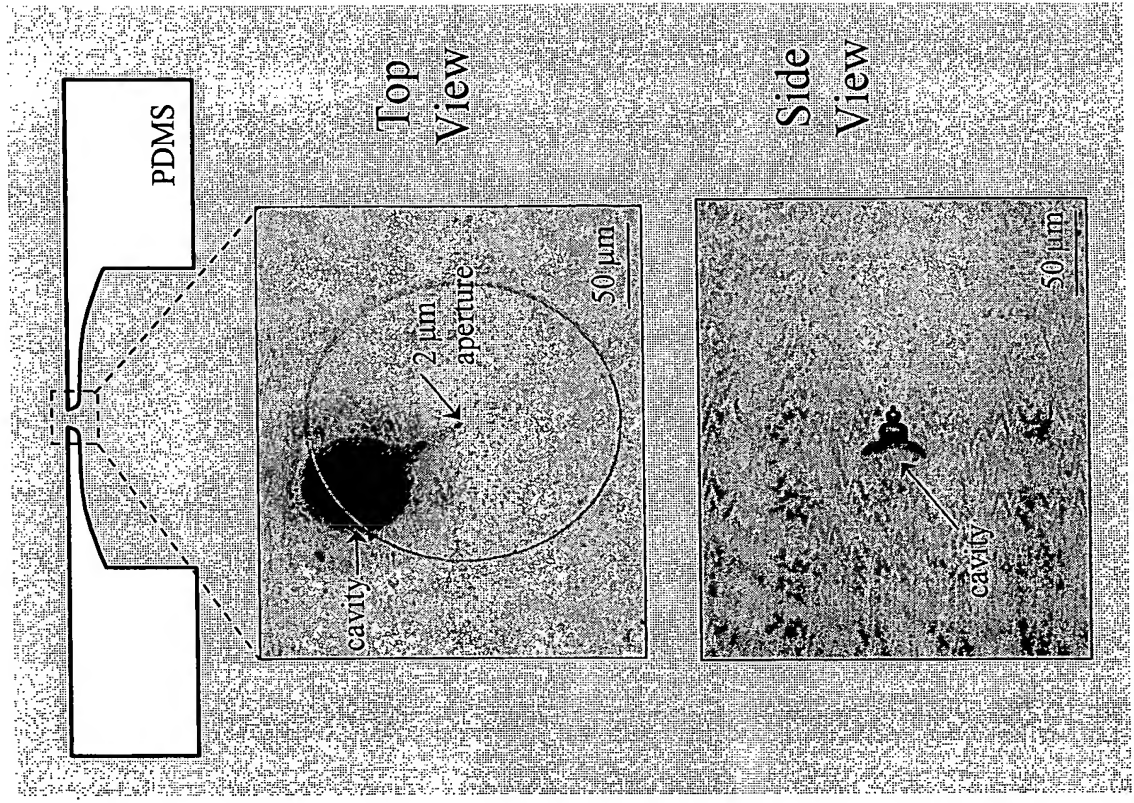




Figure 15

